

Attorney Docket No. 5649-608DV

*15/Brief
4/15/03
1083*
PATENT

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

Inventor: Jin Ho Park
Serial No.: 09/884,487
Filed: June 18, 2001
For: MULTIPLE OUTPUT DC/DC VOLTAGE CONVERTERS

Confirmation No. 5097
Group Art Unit: 2673
Examiner: J. Piziali

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March 31, 2003

APR 10 2003

Technology Center 2600

Commissioner for Patents
Washington, DC 20231

APPELLANT'S BRIEF ON APPEAL UNDER 37 C.F.R. §1.192

Sir:

This Appeal Brief is filed in triplicate pursuant to the "Notice of Appeal to the Board of Patent Appeals and Interferences" dated February 10, 2003.

REAL PARTY IN INTEREST

The real party in interest is Assignee Samsung Electronics Co., Ltd., Republic of Korea.

RELATED APPEALS AND INTERFERENCES

To Appellant's knowledge, there are no currently pending appeals or interferences related to the present appeal.

STATUS OF CLAIMS

Appellant appeals the final rejection of all of pending Claims 10-18, which as of the filing date of this Appeal Brief remain finally rejected in the Final Official Action of November 12, 2002 (the "Final Official Action"). The attached Appendix presents the claims at issue as rejected in the Final Official Action.

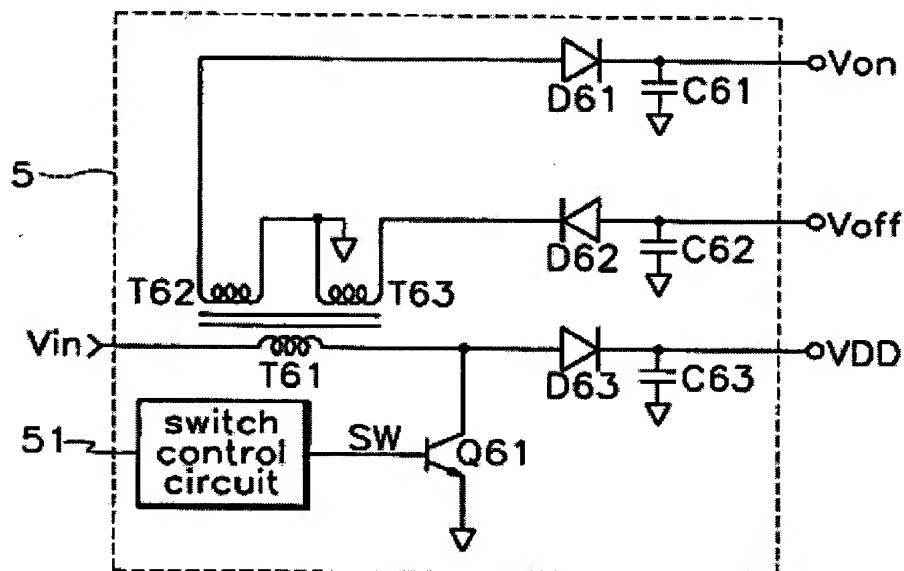
STATUS OF AMENDMENTS

There have been no amendments filed subsequent to the Final Official Action.

SUMMARY OF THE INVENTION

The present invention relates to DC/DC converters, i.e., voltage converters that convert a DC input voltage to one or more DC output voltages. More specifically, the present invention provides a multiple DC output voltage DC/DC converter, wherein a first DC output voltage of the multiple DC output voltage DC/DC converter is generated from a primary coil of a transformer, and a second DC output voltage of the multiple DC output voltage DC/DC converter is generated from a secondary coil of the transformer. Figure 6 of the present application, reproduced below for the convenience of the Board, illustrates an embodiment of the present invention.

FIG. 6



Referring to Figure 6, a multiple output voltage DC/DC converter 5 includes a transformer having a primary coil T61 and a secondary coil, for example T62, that are coupled to one another by magnetic induction. A switch, such as transistor Q61, is connected to the primary coil T61, and controls current switching therein. A first DC output voltage V_{DD} of the multiple DC output DC/DC converter is generated from the primary coil T61. A

second DC output voltage **V_{on}** of the multiple DC output voltage DC/DC converter is generated from the secondary coil **T62**.

Other embodiments of the invention add a first rectifier, such as diode **D63**, and a second rectifier, such as diode **D61**. The first rectifier **D63** is connected to the primary coil **T61** to generate the first DC output voltage **VDD**. The second rectifier **D61** is connected to the secondary coil **T62** to generate the second DC output voltage **V_{on}**. Still other embodiments of the invention provide an input voltage port **V_{in}** that is connected to the primary coil **T61**, to provide a DC input voltage to the primary coil **T61**. All of these embodiments are described in the specification, for example Page 8, line 12-Page 10, line 13.

Thus, embodiments of the invention can provide DC/DC converters that can provide multiple output voltages with high efficiency by generating an output voltage from the primary coil of a transformer in addition to generating another output voltage from the secondary coil of the transformer. All of the pending Claims 10-18 have been rejected under 35 USC §102(b) as being anticipated by U.S. Patent 5,325,283 to Farrington et al. (hereafter "Farrington"). However, as will be described in detail below, Farrington is a single output DC/DC converter that does not use a primary coil of a transformer to provide any output voltage.

ISSUES

(1) Does Farrington describe a multiple DC output voltage DC/DC converter that generates a DC output voltage from the primary coil of a transformer, as recited in independent Claims 10 and 14, and dependent Claims 12, 13 and 16?

(2) Does Farrington describe a multiple DC output voltage DC/DC converter that connects a rectifier to the primary coil to generate a DC output voltage, as recited in dependent Claims 11 and 15?

(3) Does Farrington describe a multiple DC output voltage DC/DC converter that includes a separate input voltage port that is connected to the primary coil of a transformer to provide a DC input voltage to the primary coil, as recited in Claims 17 and 18?

GROUPINGS OF CLAIMS

For purposes of this Appeal, independent Claims 10 and 14, and dependent Claims 12, 13 and 16, related to generating a DC output voltage from the primary coil of a transformer, may be grouped together, stand or fall together, and will be referred to herein as "Group 1". Dependent Claims 11 and 15, related to a rectifier that generates a DC output voltage from the primary coil, may be grouped together, stand or fall together, are independently patentable, and will be referred to herein as "Group 2". Dependent Claims 17 and 18, related to the input voltage port, may be grouped together, stand or fall together, are independently patentable, and will be referred to herein as "Group 3".

ARGUMENT

I. INTRODUCTION

All of pending Claims 10-18 have been rejected under 35 USC §102(b) as being anticipated by Farrington. In this regard, Appellant wishes to note that anticipation requires that each and every element of the claim is found in a single prior art reference. *W. L. Gore & Associates Inc. v. Garlock, Inc.*, 721 F.2d 1540, 1554, 220 U.S.P.Q. 303, 313 (Fed. Cir. 1983). Stated another way, all material elements of a claim must be found in one prior art source. *In re Marshall*, 198 U.S.P.Q. 344 (C.C.P.A. 1978). "Anticipation under 35 U.S.C. § 102 requires the disclosure in a single piece of prior art of each and every limitation of a claimed invention." *Apple Computer Inc. v. Articulate Systems Inc.* 57 USPQ2d 1057, 1061 (Fed. Cir. 2000). A finding of anticipation further requires that there must be no difference between the claimed invention and the disclosure of the cited reference as viewed by one of ordinary skill in the art. *See Scripps Clinic & Research Foundation v. Genentech Inc.*, 927 F.2d 1565, 1576, 18 U.S.P.Q. 2d 1001, 1010 (Fed. Cir. 1991). Additionally, the cited prior art reference must be enabling, thereby placing the allegedly disclosed matter in the possession of the public. *In re Brown*, 329 F.2d 1006, 1011, 141 U.S.P.Q. 245, 249 (C.C.P.A. 1964). Thus, the prior art reference must adequately describe the claimed invention so that a person of ordinary skill in the art could make and use the invention.

As analyzed in detail below, Appellant submits that Claims 10-18 are not anticipated by Farrington.

II. ARGUMENTS IN SUPPORT OF ISSUES PRESENTED

A. The Group 1 Claims, Related to the Generation of a First DC Output Voltage of a Multiple DC Output Voltage DC/DC Converter From a Primary Coil of a Transformer, Are Not Anticipated by Farrington

The Group 1 claims include independent Claims 10 and 14, and dependent Claims 12, 13 and 16. Claim 10 is representative:

10. A multiple DC output voltage DC/DC converter comprising:
 - a transformer including a primary coil and a secondary coil that are coupled to one another by magnetic induction; and
 - a switch that is connected to the primary coil and that controls current switching therein;
- wherein a first DC output voltage of the multiple DC output voltage DC/DC converter is generated from the primary coil and a second DC output voltage of the multiple DC output voltage DC/DC converter is generated from the secondary coil.

For the convenience of the Board, Figures 1 and 2 of Farrington are reproduced on the next page. The rejection of Claims 10-18 as being anticipated by Farrington is based on Farrington Figure 2 and the accompanying text. However, Farrington prior art Figure 1 will also be referred to herein briefly.

U.S. Patent

June 28, 1994

Sheet 1 of 11

5,325,283

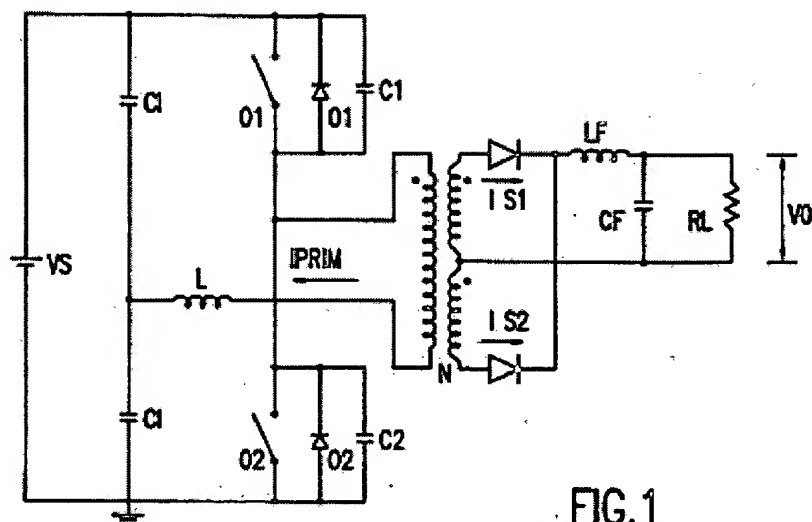


FIG. 1
 PRIOR ART

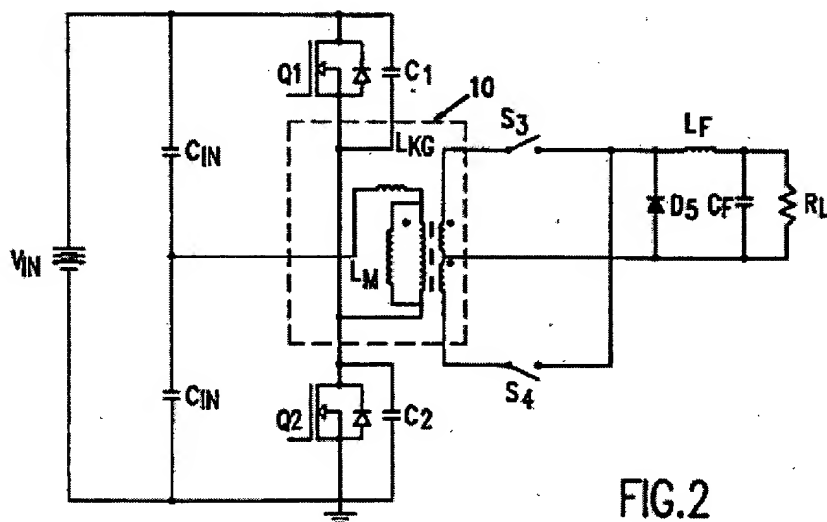


FIG. 2

Farrington Figure 2 clearly does not anticipate Claim 10 at least because:

- (1) Farrington describes a single DC output voltage DC/DC converter, not a multiple DC output voltage DC/DC converter as repeatedly recited in Claim 10.
- (2) Farrington only produces a single output voltage, across the load resistor R_L of Figure 2, as indicated analogously in Farrington Figure 1, by the output voltage designation V_0 .
- (3) Conventional interpretation of a circuit diagram, such as Farrington Figure 2, indicates that Farrington's DC/DC converter operates on a battery input voltage V_{IN} and produces an output voltage V_0 across a load, represented by a load resistance R_L . There is no teaching or suggestion in Farrington that a first DC output voltage is generated from the primary coil of Farrington's transformer and a second DC output is generated from the secondary coil of the transformer.

Notwithstanding the plain meaning of Claim 10 and the plain meaning of the circuit diagram of Farrington Figure 2, the Final Official Action contended, at Page 2, Paragraph 2, that Farrington's single output DC/DC converter also produces a DC output voltage at the input capacitor C_{IN} of Figure 2. However, Appellant respectfully submits that this interpretation is contrary to the plain meaning of Claim 10 and the plain meaning of Farrington's circuit diagram. In particular, in a circuit diagram, an input generally is placed at the left, and an output at the right. The sole input voltage in Farrington et al. Figure 2 is the input battery V_{IN} and the sole output voltage of Farrington et al. Figure 2 is the voltage V_O across the load resistor R_L . The capacitors C_{IN} clearly are conventional input filter capacitors, and do not generate a first DC output voltage of a multiple DC output voltage DC/DC converter, as clearly recited in Claim 10.

In response to these arguments, the Final Official Action contended at Page 2, Paragraph 3, that the first DC output voltage is present at C_{IN} , by stating:

There are clearly and inherently voltages generated across the above cited circuits when Farrington's converter is in operation.

Appellant agrees that when a circuit is in operation, it generates many internal voltages. However, the voltage across input capacitor C_{IN} may not be regarded as a first DC output voltage of the multiple DC output voltage DC/DC converter that is generated from the primary coil, as recited in Claim 10. As shown above, this interpretation would be contrary

to the plain meaning of the circuit diagram of Farrington Figure 2. Moreover, this interpretation would be contrary to the plain meaning of the recitation "a first DC output voltage of the multiple DC output voltage DC/DC converter" of Claim 1, which is prohibited under MPEP §2111.01. Finally, the conclusionary statement that Farrington's input capacitor inherently provides a second output voltage of Farrington's single output voltage DC/DC converter, would violate the stringent requirements of a rejection based on inherency under MPEP §2112.

For at least these reasons, independent Claims 10 and 14, and dependent Claims 12, 13 and 16 are patentable over Farrington.

B. The Group 2 Claims, Related to a Rectifier That Is Connected to the Primary Coil to Generate the First DC Output Voltage of the Multiple DC Output Voltage DC/DC Converter, Are Independently Patentable Over Farrington

The Group 2 claims include dependent Claims 11 and 15. Claim 11 is representative. Claim 11 recites:

11. A converter according to Claim 10 further comprising a first rectifier and a second rectifier, wherein the primary coil is connected between an input voltage and the switch, wherein the first rectifier is connected to the primary coil to generate the first DC output voltage of the multiple DC output voltage DC/DC converter therefrom and wherein the second rectifier is connected to the secondary coil to generate the second DC output voltage of the multiple DC output voltage DC/DC converter therefrom.

Again turning to Farrington Figure 2, the Final Official Action notes, at Page 4, Paragraph 3, that there is a diode (unlabeled) shunted across switch **Q1**. However, this diode is not connected between the primary of the transformer and the input capacitor C_{IN} . Even if it was so connected, the diode cannot be regarded as a first rectifier that is connected to the primary coil to generate the first DC output voltage of the multiple DC output voltage DC/DC converter therefrom, because it is shunted across the switch **Q1** so that it would not appear to generate a DC output voltage from the switch **Q1**. For at least these reasons, dependent Claims 11 and 15 are separately patentable.

C. The Group 3 Claims, Related to an Input Voltage Port That is Connected to the Primary Coil, Are Independently Patentable Over Farrington

The Group 3 claims include dependent Claims 17 and 18. Claim 17 is representative. Claim 17 recites:

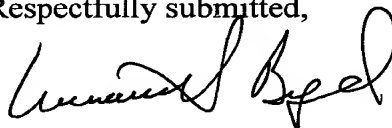
17. A converter according to Claim 10 further comprising:
an input voltage port that is connected to the primary coil to provide a DC
input voltage to the primary coil.

Referring again to Figure 6 of the present application, the input voltage port **V_{in}** is separate and distinct from the first DC output voltage **V_{DD}** that is generated from the primary coil **T61**. However, in Farrington Figure 2, even assuming for the sake of argument that the input capacitor **C_{IN}** actually provides an output voltage, there is no separate input voltage port, because the input voltage source **V_{IN}** is directly connected across the input capacitor **C_{IN}**. Claims 17 and 18 are therefore independently patentable over Farrington.

CONCLUSION

The Final Official Action appears to use internal voltages that may be generated across internal components of Farrington's single output DC/DC converter, to improperly reject the multiple DC output voltages of the claimed invention that are generated from both the primary coil and the secondary coil of a transformer. This interpretation is contrary to the plain meaning of the claims, the plain meaning of Farrington and the plain meaning of a circuit diagram. For at least these reasons, Appellant respectfully requests reversal of the Final Official Action and allowance of the pending claims.

Respectfully submitted,



Mitchell S. Bigel
Registration No. 29,614
Attorney for Appellant

Correspondence Address



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CERTIFICATE OF MAILING

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Susan E. Freedman

Date of Signature: March 31, 2003

APPENDIX

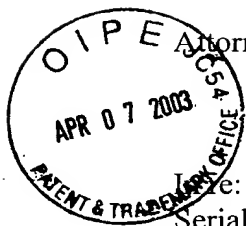
10. A multiple DC output voltage DC/DC converter comprising:
a transformer including a primary coil and a secondary coil that are coupled to one another by magnetic induction; and
a switch that is connected to the primary coil and that controls current switching therein;
wherein a first DC output voltage of the multiple DC output voltage DC/DC converter is generated from the primary coil and a second DC output voltage of the multiple DC output voltage DC/DC converter is generated from the secondary coil.
11. A converter according to Claim 10 further comprising a first rectifier and a second rectifier, wherein the primary coil is connected between an input voltage and the switch, wherein the first rectifier is connected to the primary coil to generate the first DC output voltage of the multiple DC output voltage DC/DC converter therefrom and wherein the second rectifier is connected to the secondary coil to generate the second DC output voltage of the multiple DC output voltage DC/DC converter therefrom.
12. A converter according to Claim 11 wherein the first rectifier comprises a first diode and a first capacitor and wherein the second rectifier comprises a second diode and a second capacitor.
13. A converter according to Claim 10 further comprising an inductor that is coupled across the primary coil, wherein the first DC output voltage of the multiple DC output voltage DC/DC converter is generated from the primary coil and from the inductor.
14. A multiple DC output voltage DC/DC converter comprising:
a transformer including a primary coil and a secondary coil that are coupled to one another by magnetic induction;
an inductor that is coupled across the primary coil; and
a switch that is connected to the inductor and that controls current switching therein;
wherein a first DC output voltage of the multiple DC output voltage DC/DC converter is generated from the inductor and a second DC output voltage of the multiple DC output voltage DC/DC converter is generated from the secondary coil.

15. A converter according to Claim 14 further comprising a first rectifier and a second rectifier, wherein the inductor is connected between an input voltage and the switch, wherein the first rectifier is connected to the inductor to generate the first DC output voltage of the multiple DC output voltage DC/DC converter therefrom and wherein the second rectifier is connected to the secondary coil to generate the second DC output voltage of the multiple DC output voltage DC/DC converter therefrom.

16. A converter according to Claim 15 wherein the first rectifier comprises a first diode and a first capacitor and wherein the second rectifier comprises a second diode and a second capacitor.

17. A converter according to Claim 10 further comprising:
an input voltage port that is connected to the primary coil to provide a DC input voltage to the primary coil.

18. A converter according to Claim 14 further comprising:
an input voltage port that is connected to the primary coil to provide a DC input voltage to the primary coil.



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TRANSMITTAL OF APPEAL BRIEF
(PATENT APPLICATION--37 C.F.R. § 1.192)

1. Transmitted herewith, in triplicate, is the APPEAL BRIEF in this application, with respect to the Notice of Appeal filed on February 10, 2003.
2. This application is filed on behalf of
☐ a small entity
A verified statement ☐ is attached; ☐ was already filed.
3. Pursuant to 37 C.F.R. § 1.17(c), the fee for filing the Appeal Brief is:

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Respectfully submitted,

Mitchell S. Bigel

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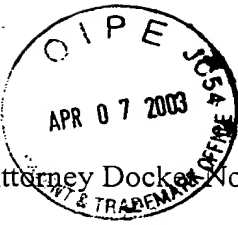
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Susan E. Freedman

Date of Signature: March 31, 2003



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